



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2022-0587; Project Identifier AD-2022-00394-E; Amendment 39-22170; AD 2022-19-01]

RIN 2120-AA64

Airworthiness Directives; General Electric Company Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain General Electric Company (GE) GEnx-2B67/P model turbofan engines. This AD was prompted by the detection of an iron inclusion in a forging, which may reduce the fatigue life of certain low-pressure turbine rotor (LPTR) stage 4 disks and LPTR stage 6 disks. This AD requires the removal of certain LPTR stage 4 disks and LPTR stage 6 disks from service and replacement with parts eligible for installation. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES:

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) by searching for and locating Docket No. FAA-2022-0587; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Alexei Marqueen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7178; email: Alexei.T.Marqueen@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain GE GEnx-2B67/P model turbofan engines with an affected LPTR stage 4 disk or LPTR stage 6 disk installed, identified by part number and serial number. The NPRM published in the *Federal Register* on June 22, 2022 (87 FR 37247). The NPRM was prompted by the engine manufacturer notifying the FAA of the detection of an iron inclusion in a forging, which may reduce the fatigue life of certain LPTR stage 4 disks and LPTR stage 6 disks. The manufacturer's investigation determined that the inclusion is a melt-related defect and that, as a result of the inclusion forming in the forging, certain LPTR stage 4 disks and LPTR stage 6 disks may have reduced material properties and a lower fatigue life capability. Reduced material properties may cause premature LPTR stage 4 disk and LPTR stage 6 disk fracture, which could result in uncontained debris release. As a result of its investigation, the manufacturer published service information that specifies procedures for the removal and replacement of certain LPTR stage 4 disks and LPTR stage 6 disks installed on GEnx-2B67/P model turbofan engines. This condition, if not addressed, could result in uncontained debris release, damage to the engine, and damage to the airplane. In the NPRM, the FAA proposed to require the removal of certain LPTR stage 4 disks and LPTR stage 6 disks from service and replacement with parts eligible for installation. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received one comment, from The Boeing Company (Boeing). Boeing concurred with the contents of the NPRM.

Conclusion

The FAA reviewed the relevant data, considered the comment received, and determined that air safety requires adopting the AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, this AD is adopted as proposed in the NPRM.

Related Service Information

The FAA reviewed GE GENx-2B Service Bulletin (SB) 72-0448 R00, dated February 7, 2022. This SB describes procedures for removing the affected LPTR stage 4 disks and LPTR stage 6 disks from service.

Costs of Compliance

The FAA estimates that this AD affects 4 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
Replace the LPTR stage 4 disk	500 work-hours x \$85 per hour = \$42,500	\$378,400	\$420,900	\$1,262,700
Replace the LPTR stage 6 disk	500 work-hours x \$85 per hour = \$42,500	\$208,900	\$251,400	\$251,400

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2022-19-01 General Electric Company: Amendment 39-22170; Docket No. FAA-2022-0587; Project Identifier AD-2022-00394-E.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to General Electric Company (GE) GEnx-2B67/P model turbofan engines with an installed:

(1) Low-pressure turbine rotor (LPTR) stage 4 disk, part number (P/N) 2440M64P01, with serial number (S/N) JHVPD762, JHVPD763, JHVPD764, or JHVPD765; or

(2) LPTR stage 6 disk, P/N 2440M66P01, with S/N JHVVD753 or JHVVD754.

(d) Subject

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

(e) Unsafe Condition

This AD was prompted by the detection of an iron inclusion in a forging, which may reduce the fatigue life of certain LPTR stage 4 disks and LPTR stage 6 disks. The FAA is issuing this AD to prevent fracture and subsequent uncontainment of the LPTR stage 4 disk and LPTR stage 6 disk. The unsafe condition, if not addressed, could result in uncontained debris release, damage to the engine, and damage to the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) Before the affected LPTR stage 4 disk exceeds 3,000 cycles since new (CSN), remove the affected LPTR stage 4 disk from service and replace with an LPTR stage 4 disk eligible for installation.

(2) Before the affected LPTR stage 6 disk exceeds 5,000 CSN, remove the affected LPTR stage 6 disk from service and replace with an LPTR stage 6 disk eligible for installation.

(h) Definitions

(1) For the purpose of this AD, an “LPTR stage 4 disk eligible for installation” is an LPTR stage 4 disk that does not have P/N 2440M64P01, with S/N JHVPD762, JHVPD763, JHVPD764, or JHVPD765.

(2) For the purpose of this AD, an “LPTR stage 6 disk eligible for installation” is an LPTR stage 6 disk that does not have P/N 2440M66P01, with S/N JHVVD753 or JHVVD754.

(i) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in paragraph (j) of this AD and email to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(j) Related Information

For more information about this AD, contact Alexei Marqueen, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7178; email: Alexei.T.Marqueen@faa.gov.

(k) Material Incorporated by Reference

None.

Issued on August 29, 2022.

Ross Landes, Deputy Director for Regulatory Operations,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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